Phonological profiles of 2-year-olds with expressive-only and expressive and receptive language delay.

1. Abstract

Late talkers comprise 10-15% of young children. They gain new words more slowly and begin combining words into phrases later than their typically developing peers. This language delay is associated with negative effects on reading and social skill development. Identification of predictive factors for continued language delay, including sound production skills, is important so that appropriate speech-language intervention can be directed. The purpose of this descriptive study is to investigate the phonetic inventories and percent of accurate consonant sound usage among subgroups late-talking toddlers. It is hypothesized that children with expressive (one subgroup) and receptive language delays will have smaller phonetic inventories and lower percent consonants correct than toddlers with expressive-only language delay (the other subgroup).

2. Project Description.

The study aim is to better understand differences in phonetic inventory and accurate consonant sound capabilities of two-year-old children identified with expressive-only language delay and children identified with expressive-receptive language delay. Little is known about the expressive phonological (i.e., speech-sound production) skills of late talkers with expressive and receptive language delay. Overall, these children tend to exhibit less-developed expressive communication skills, such as gesturing, compared with peers identified as expressive-only language delayed (Kahn et al., 2009; Thal, Tobias, Morrison, 1991; Thal & Tobias, 1992). To date, no study has investigated the possible differences in phonological development among late talkers, although this information is helpful for identification and early intervention services. With no generalizable, baseline data regarding the speech-sound inventory of late talkers with expressive and receptive language delay, research findings provides little indication of best practice for intervention with this population. The proposed study will address the following research questions:

1. Are there differences in phonetic inventory between 2-year-olds identified as expressive-only language delayed and those identified as expressive-receptive language delayed?
2. Are there difference in percentage of consonants correctly produced between 2-year-olds identified as expressive-only language delayed and those identified as expressive-receptive language delayed?

2.1 Product.

The results of this project will result in dissemination through presentation at the University of Nebraska at Omaha Student Research Fair, the Nebraska Speech Language and Hearing Association Conference, and the American Speech Language and Hearing Association Annual Conference. Furthermore, the results will be distributed through thesis and manuscript publication in a peer-reviewed journal.

2.2 Contribution to student’s learning.

Inquiry-based learning through hands-on experience will be beneficial to the graduate student as she begins her practice as a future speech-language clinician. The student will be going on home visits, which will provide clinical experiences unique to the graduate student’s area of research interest. These home visits will provide opportunities for the graduate student to work with late talking toddlers in an early intervention setting, similar to what she may be working in as a practicing clinician. In clinical research, it is imperative that the researcher has mastered his or her clinical practice. This research study gives the graduate student the opportunity to master facets of her clinical practice while establishing groundbreaking research.

While the experience will provide clinical experience, it will also allow for a research opportunity that is rich in an area that has not been explored. Currently, the graduate student is pursuing her masters degree, but would eventually like to get her doctorate in speech-language pathology, where she would specialize in late talking toddlers. Since the graduate student is
interested in an academic research career, exploring clinical research through creating
generalizable, descriptive, baseline data provides an awarding opportunity to learn more about the
research process in preparation for a career in academia.

2.3 Contribution to the field: Conceptual importance.

Since expressive vocabulary growth facilitates phonological perception skills (Gershkoff-Stowe & Hahn, 2007) and word learning (Storkel & Morrittsette, 2002), it is likely that expressive
and receptive late talkers will have more difficulty with these skills. There is little evidence
regarding the influence of comprehension skills on expressive speech-sound output;
consequently, it is unclear if expressive and receptive delayed children will have smaller speech-
sound inventories than those with an expressive-only delay. This study has direct implications
for early intervention, making findings valuable to speech-language pathologists.

Due to the lack of research on children with expressive-receptive language delay, little is
known about effective and viable treatment options for this population. Little research has been
done on this population, even though they appear to be the most at risk for academic and social
deficits. With no generalizable, baseline data, researchers are unable to create intervention
strategies appropriate for this subgroup. This study acts as a generalizable baseline to provide
basic understanding of these young children’s speech-sounds in order to create intervention
methods in future research studies.

3. Methodology.

3.1 Participants.

The study will include a 20-participant data set. Participants may be 24-36 month old.

3.2 Data collection procedure.

For each participant, a speech sample will be obtained and videotaped in the participant's
home. The speech sample will consist of 20-minute caregiver-child interactions involving semi-
structured play, during which the caregivers and children will have the opportunity to play
independently with one another. All caregivers will be given the following instructions before
beginning, "I want to see what kind of activities [your child] enjoys. I'd like to see how [your
child] communicates when s/he enjoys what s/he is doing. So, play and have fun. Help [your
child] enjoy what s/he’s doing."

3.3 Data analysis procedure.

From the videotaped speech samples, the graduate student, trained in phonetic
transcription, and faculty mentor will independently phonetic transcribe all 20-speech samples
using the International Phonetic Alphabet (IPA). Exercising the same procedures as Morris
(2009), all vocalizations will be transcribed and target words recorded whenever possible. The
graduate student will note the session time (e.g., 2:13) to ease transcription matching. Because
identifying word productions is difficult when transcribing young children’s speech, when the
transcription of consonants in a word differs between transcribers by at least one speech sound
(i.e., phoneme), the transcribers will watch the video sample together and determine the final
transcription to be used in calculations.

3.3.a Phonetic Inventory Calculation Procedures.

Phonetic inventory is a “listing or count of a child’s sound productions without regard to
accuracy when compared to the adult target. It is used to indicate the breadth of the child’s
productive phonetic knowledge” (Morris, 2009, p. 52). The graduate investigator will employ the
procedures used by Morris, (2009) such that, when reviewing the transcribed speech samples,
each phoneme that occurred in at least two different words will be recorded as ‘productive.’ A
count of productive consonants in initial and final word positions will be computed (Morris,
2009) and compared across participants.

3.3.b Percentage of Consonants Correct - Revised (PCC-R) Calculation Procedures.

The Percentage of Consonants Correct (PCC) analysis is used to express the percentage
of intended consonant sounds in a speech sample articulated correctly when compared with adult
production standards (Shriberg, Austin, Lewis, McSweeny, & Wilson, 1997). The PCC-R
measure is calculated in the same way as PCC, but both accurately articulated phonemes and phoneme distortions are scored as correct (Shriberg et al., 1997). The graduate investigator will use procedures outlined by Shriberg et al. (1997) for PCC-R because of its sensitivity to common distortions heard in young children’s speech.

3.3.c. Inter-observer agreement.

The graduate student will conduct all speech sample analyses for each participant. The faculty mentor will recalculate 100% of the data set. The resulting point-by-point agreement between the two researchers will meet or exceed 80% for data to be used in the final analysis.

3.4 Data Analysis

After the data are encoded, a one-tailed t-test will be used to compare the means of the two groups. The t-test will compare the means of expressive-only and expressive and receptive language delayed children’s phonetic inventory (initial consonants used; final consonants used; overall consonants used). An alpha level of .05 will be used for statistical analysis. Three separate one-tailed t-tests will be used for analysis of initial consonants produced, final consonants produced, and overall consonants used.

A one-tailed t-test will also be run on the two subgroups to compare their PCC-R. This t-test will also be done at the alpha level of .05. This analysis will also have clinical and theoretical implications, which will provide better intervention for children with an expressive and receptive language delay.

4. Projected Project Time Line.

<table>
<thead>
<tr>
<th>Month</th>
<th>Description</th>
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<tbody>
<tr>
<td>Spring 2014</td>
<td>Obtain necessary project materials; begin participant recruitment and data collection.</td>
</tr>
<tr>
<td>Spring/Summer 2014</td>
<td>Continue participant recruitment and data collection. Submit presentation proposals to state and national conventions. Begin transcription of videotaped speech samples.</td>
</tr>
<tr>
<td>Fall 2014</td>
<td>Faculty mentor transcribes 20% of speech samples for reliability. Conduct data analysis (phonetic inventory and percent consonants correct - revised). Compare group data for the two analysis measures. Prepare and present findings for state and national conventions. Finalize thesis for defense.</td>
</tr>
<tr>
<td>Spring 2015</td>
<td>Present at the UNO Student Research and Creative Activity Fair; prepare manuscript for research journal submission.</td>
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5. Student Faculty Roles.

<table>
<thead>
<tr>
<th>Student Roles</th>
<th>Faculty Roles</th>
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</thead>
<tbody>
<tr>
<td>• Proctor assessments at home visits</td>
<td>• Directly supervise 20% home visits</td>
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<tr>
<td>• Contact faculty mentor and participants</td>
<td>• Oversee and review data collection</td>
</tr>
<tr>
<td>• Collect, analyze, and encode data</td>
<td>• Evaluate research design and results</td>
</tr>
<tr>
<td>• Prepare, create, and edit manuscript for publication</td>
<td>• Assess written analysis of research</td>
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<tr>
<td>• Submit article for publication</td>
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<tr>
<td>• Prepare presentation for dissemination</td>
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</table>
5. Bibliography.

References


7. **Budget Justification.**

Note: The UNO College of Education and Department of Special Education and Communication Disorders have provided the following tools and materials to support research projects conducted under the supervision of the graduate student’s faculty mentor: shared lab space in Roskens Hall and computers and equipment for data processing, transcription, and analysis.

<table>
<thead>
<tr>
<th>Budget</th>
<th>Cost</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Summer Salary</td>
<td>$4,000.00</td>
<td>I am requesting $4,000.00 for student summer stipend. The student stipend of $4,000 will help cover costs of basic living while I devote myself to this project. I plan to spend a minimum of 200 hours on this project and the stipend will allow me to allocate ample time to the project without having to schedule around an off-campus job.</td>
</tr>
<tr>
<td>Materials and Supplies</td>
<td>$450.00</td>
<td>The request for $250.00 will go towards office supplies (additional assessment protocol, DVDs, DVD cases, paper, printing, and poster preparation costs).</td>
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<tr>
<td>Total of Request</td>
<td>$4,450</td>
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